Journal of Surgical Oncology 62:249–252 (1996)

Endobronchial Metastatic Disease: Analysis of 32 Cases

ANTONIETA SALUD, MD, JOSÉ MANUEL PORCEL, MD, ANGELS ROVIROSA, MD, AND JOAQUIM BELLMUNT, MD

From the Department of Internal Medicine, University Hospital Arnau de Vilanova, Lleida, Spain (A.S., J.M.P.), and the Department of Oncology and Radiotherapy, University Hospital Vall d'Hebron (A.R., J.B.), Barcelona, Spain

Endobronchial metastasis (EM) from nonpulmonary tumors is uncommon. A 9-year retrospective study at the University Hospital Vall d'Hebron (Barcelona, Spain) identified 32 patients with EM. All but four cases were diagnosed by fiberoptic bronchoscopy with bronchial biopsy. Primary tumors included the following types: breast cancer (20), colorectal cancer (3), melanoma (2), gastric cancer (1), neuroblastoma of the olfactory nerve (1), abdominal leiomyosarcoma (1), hypernephroma (1), endometrial carcinoma (1), papillary thyroid cancer (1), and hepatocarcinoma (1). Median age at diagnosis of EM was 58.7 years and median interval from the diagnosis of the primary tumor to the diagnosis of EM was 50.4 months. Seventeen patients (53%) had evidence of other metastatic sites at endobronchial relapse. The more common clinical manifestations included cough (37.5%), haemoptysis (28%), dyspnea (18.7%), and recurrent pulmonary infections (6.2%). Eight patients (25%) had no symptoms. There appears to be a predilection for metastatic involvement of the right and left upper lobe bronchus. Treatment was instituted in 20 patients, and their median survival was 11 months, in comparison with the 3 months found in 12 patients who received only palliative therapy because of advanced disseminated disease. Breast cancer is the most common tumor causing EM. The prognosis of patients with EM depends on the type of the primary tumor and the presence of other metastatic sites. Treatment must be individualized.

KEY WORDS: endobronchial metastasis, breast cancer, bronchoscopy

INTRODUCTION

Endobronchial metastasis (EM) is found at necropsy in 2–5% of patients who die with cancer [1]. Clinical diagnosis is unlikely to be made unless airway obstruction, persistent cough, or hemoptysis is present. Therefore, early effective treatment is often omitted, which impairs the prognosis. In recent years, the wider use of fiberoptic bronchoscopic examination has allowed EM to be diagnosed more frequently, proving that this condition is far more common than appreciated in the past. Survival after the diagnosis of EM is poor because it is generally a manifestation of an advanced disease stage. However, the better results obtained with systemic treatments and the significant expansion of pulmonary therapeutic endoscopic procedures have improved the outcome.

We undertook a retrospective review of the frequency and clinical characteristics of patients with bronchial metastatic involvement, diagnosed in the University Hospital Vall d'Hebron during a period of 9 years.

PATIENTS AND METHODS

Over a 9-year period, 2,389 bronchoscopic procedures with bronchial biopsy for the diagnosis of a suspected

Accepted for publication April 15, 1996.

Address reprint requests to Dr. José M. Porcel, Prat de la Riba 78, 2-1, 25004 Lleida, Spain.

endobronchial lesion were performed at University Hospital Vall d'Hebron in Barcelona. In 1,194 procedures, a bronchogenic carcinoma was diagnosed and 28 cases were EM, accounting for 2.3% of bronchial malignant disease. Four of these cases were previously reported [2,3]. Four further patients with a chest radiography and a chest computed tomographic (CT) scan suggestive of EM, in whom a cytology of sputum was positive for malignancy, were also included. The bronchoscopic procedure was not performed in these patients because of their low performance status.

Factors affecting outcome, including other metastatic sites at EM diagnosis and administration of treatment, were assessed and correlated with the median survival time by the Kaplan–Meier method.

RESULTS

A total of 32 patients (10 male and 22 female) with EM were recorded. Primary tumors included breast cancer (20 patients), colorectal cancer (3 patients), melanoma (2 patients), gastric cancer (1 patient), neuroblastoma of the olfactory nerve (1 patient), abdominal leiomyosarcoma (1 patient), hypernephroma (1 patient), endometrial carcinoma (1 patient), papillary thyroid cancer (1 patient), and hepatocarcinoma (1 patient).

The median age at diagnosis was 58.7 years (range 37–84). The median time from diagnosis of primary tumor to the EM was 50.4 months (range 0–204). The median time to the development of EM for particular tumors was as follows: breast (60 months: range 0–204), colorectal (23 months: range 0–42), melanoma (18 months: range 12–24), kidney (60 months), neuroblastoma (10 months), thyroid (144 months), and liver (9 months). The EM was synchronously diagnosed with the primary tumor in the leiomyosarcoma, gastric, and endometrial carcinoma patients.

Clinical manifestations included cough (37.5%), hemoptysis (28%), dyspnea (18.7%), and recurrent lung infections (6.2%). In 8 patients (25%) the EM was suspected exclusively on a chest radiography during follow-up.

At diagnosis, 17 patients (53%) had evidence of other metastatic sites: bone (10 patients), pleura (8 patients), skin (5 patients), lymph nodes (4 patients), lung (3 patients), liver (1 patient), brain (1 patient), pericardium (1 patient), and subcutaneous tissue (1 patient).

The most frequent chest radiography images included atelectasis (48.3%), infiltrate (19.3%), and hilar mass (19.3%). Chest CT scan was performed in 12 patients and the images found were atelectasis (7 patients), hilar mass (3 patients), and infiltrate (2 patients). Location of EM was left main bronchus (2 patients), right main bronchus (2 patients), left upper lobe bronchus (9 patients), left lower lobe bronchus (3 patients), right upper lobe bronchus (9 patients), right middle lobe bronchus (3 patients), and right lower lobe bronchus (4 patients).

Seventeen patients with breast cancer were treated as follows: chemotherapy (7 patients), hormonal therapy (6 patients), combined chemotherapy and hormonal therapy (3 patients) and radiotherapy (1 patient). The median survival was 11 months (range 1–54). Left lobectomy was necessary in the patient with hypernephroma, who is alive after 1 year from surgery. 5-Fluorouracil was administered in one patient with colorectal carcinoma, who died after 4 months. The patient with papillary thyroid cancer presented with life-threatening hemoptysis, which was controlled by laser therapy. Twelve patients received only palliative treatment because of advanced neoplastic disease and their median survival was 3 months (range 2–24). The median survival time in 17 patients with extensive metastatic disease was 3 months, as compared to 8 months in those who had a single EM.

DISCUSSION

The presence of EM has been considered an uncommon manifestation of metastatic cancer. Braman and Whitcomb [1] found a 2% incidence of EM in cancer autopsy series. This percentage is significantly lower than those in other necropsy studies, which report a 25–50% incidence of secondary bronchial involvement by solid tumors, probably as a result of inclusion of secondary invasion of the bronchus by parenchymal masses or lymph nodes [4]. By contrast, clinical studies show a lower frequency of EM, as could be expected. However, recent reports suggest an increased incidence of EM related to the regular use of fiberoptic bronchoscopy and the longer survival of cancer patients. In our clinical study, the incidence of EM was 2.3%, a percentage similar to that reported in necropsy surveys.

The importance of differentiating EM from primary lung neoplasms should be stressed. Confusion is more likely to arise if there has been a long interval between the occurrence of the primary tumor and metastasis or if the discovery of EM antedates diagnosis of the primary tumor [5]. In addition, no absolute histopathological criteria differentiate primary and secondary tumors, although the clinical setting and immunohistochemical techniques can be useful indicators.

A variety of primary tumors have been associated with EM, although breast, renal and colorectal carcinomas predominate. Table I illustrates this point along with clinical features, chest radiography, location of EM, therapy, and survival in the largest series of the literature [5–10].

Chest CT scans were obtained in 12 patients, and a bronchoscopy was done in 8 cases. There was a good morphological correlation between the CT and the bronchoscopic findings. Since CT scan had a high sensitivity in detecting and localizing endobronchial lesions [11], it may be an accurate means for establishing the suspicion

TABLE I. Summary of Main Reported Series of Endobronchial Metastasis

Reference	No. of patients	Primary tumors (%)	Time interval[a] (mo)	Symptoms (%)	Chest radiography (%)	EM location (%)	Extrabronchial metastasis (%)	Therapy (%)	Survival (mo)
Fitzgerald 1977 [6]	17	Breast (35) Sarcoma (18)	58.5	Cough (48) Hemoptysis (24) Wheeze (10)	Atelectasis (50) Mass (25) Normal (10)	—	—	Systemic (58) RT (29) Surgery (6)	16.4
Shepherd 1982 [7]	25	Breast (20) Colon (20) Cervix (20)	67.7	—	—	—	—	Surgery (40)	19
Milleron et al. (1986) [8]	29	Head and neck (31) Colon (21) Breast (14)	—	Cough (35) Dyspnea (22)	M. nodules (24) S. nodules (17) Atelectasis (17)	Lobar B. (41) Segmental B. (27) Main B. (12)	—	—	—
Bourke et al. (1989) [5]	10	Breast (60) Renal (20) Pancreas (10)	49.2	Hemoptysis (36) Dyspnea (29) Cough (21)	Mass (50) Atelectasis (30) Infiltrate (20)	RLL B. (30) RUL B. (20) LUL B. (20)	—	—	—
Heitmiller et al. (1993) [9]	23	Breast (52) Renal (17) Colon (13)	59.9	None (52) Hemoptysis (17) Dyspnea (17)	—	LUL B. (24) RML B. (20) RLL B. (16)	87	Systemic (48) RT (22)	12.5
Martínez et al. (1994) [10]	27	Breast (55) Others (45)	51.7	Cough (52) Dyspnea (33) Hemoptysis (22)	Atelectasis (37) Mass (30) M. nodules (22)	—	50	Systemic (52) RT (7) Surgery (4)	16.1
Current series	32	Breast (63) Colon (9) Melanoma (6)	50.4	Cough (37) None (25) Others (38)[b]	Atelectasis (48) Mass (19) Infiltrate (19)	LUL B. (28) RUL B. (28) RLL B. (13)	53	Systemic (53) RT (3) Surgery (3)	7

RT, radiotherapy; M, multiple; S, solitary; B, bronchus; RUL, right upper lobe; RML, right middle lobe; RLL, right lower lobe; LUL, left upper lobe.

[a] Between diagnosis of primary tumor and EM.

[b] See text.

of EM when the bronchoscopy cannot be performed. In these cases, cytologic examination of sputum may be a helpful diagnostic tool.

Management of EM should be based on the histology of the primary tumor, anatomic location of EM, evidence of other metastatic sites, and the patient's performance status. Surgical resection, although infrequently performed, should be confined to selected patients with single EM [9]. Therapeutic bronchoscopic procedures such as endobronchial radiation (brachytherapy) [12], photodynamic therapy, electrocoagulation, forceps, intratumoral ethanol injections, diathermic snares, prosthetic stents, and, most importantly, Nd:Yag laser debulking therapy, could be employed in the definitive or palliative treatment of EM [12]. External radiation therapy may be valuable in some patients whose respiratory symptoms are the predominant manifestation of metastatic disease, but high doses are required and complications are frequently encountered. Chemotherapy and hormonal treatment are indicated in responsive tumors, namely metastatic breast cancer. Nevertheless, if respiratory symptoms predominate, combining these treatments with local therapy is necessary.

CONCLUSIONS

Patients with EM do not necessarily show a short survival rate, especially those with breast cancer or with solitary EM. However, the presence of extrabronchial spread adversely affects outcome. From the literature reviews, it is difficult to come to statistical conclusions regarding treatments and survival, since the series of patients are limited and include many different types of primary tumors and treatments.

REFERENCES

1. Braman SS, Whitcomb ME: Endobronchial metastasis. Arch Intern Med 135:543–547, 1975.
2. Rovirosa A, Bellmunt J, Salud A, et al.: Endobronchial metastases in colorectal adenocarcinoma. Tumori 78:270–273, 1992.
3. Olm M, Mesa J, Simó R, Obiols G: Metástasis endobronquial de un carcinoma papilar de tiroides. Hemoptisis masiva y laserterapia. Med Clin (Barc) 96:394, 1991.
4. Baumgartner WA, Mark JBD: Metastatic malignancies from distant sites to tracheobronchial tree. J Thorac Cardiovasc Surg 79:499–503, 1980.
5. Bourke SJ, Henderson AF, Stevenson RD, Banham SW: Endobronchial metastases simulating primary carcinoma of the lung. Respir Med 83:151–152, 1989.
6. Fitzgerald RH Jr: Endobronchial metastases. South Med J 70:440–441, 443, 1977.
7. Shepherd MP: Endobronchial metastatic disease. Thorax 37:362–365, 1982.
8. Milleron B, Jean T, Fouret P, et al.: Les métastases endobronchiques des cancers. Rev Pneumol Clin 42:231–234, 1986.
9. Heitmiller RF, Marasco WJ, Hruban RH, Marsh BR: Endobronchial metastasis. J Thorac Cardiovasc Surg 106:537–542, 1993.
10. Martínez E, Aparicio J, Sanchís J, et al.: Metástasis endobronquiales. Clínica, diagnóstico y evolución en una serie de 27 casos. Rev Clin Esp 194:1013–1017, 1994.
11. Colleti PM, Beck S, Boswell WD, et al.: Computed tomography in endobronchial neoplasms. Comput Med Imag Graph 14:257–262, 1990.
12. Pish J, Villamena P, Harvey J et al.: High dose-rate endobronchial irradiation in malignant airway obstruction. Chest 104:721–725, 1993.
13. Kurtz RC, Lightdale CJ, Ginsberg RJ: Specialized techniques of cancer management and diagnosis. In DeVita VT, Hellman S, Rosenberg SA (eds): "Cancer: Principles and Practice of Oncology." Philadelphia: J.B. Lippincott, 1993, p492–506.